

F.05

Subject: Considerations and design guidelines for water treatment plant solids disposal

Purpose: Both DSHS and DOE are involved with plan review for solids disposal facilities used to handle backwash solids from filter plants. The facility most often used is the settling pond. The guidelines given below should be of assistance for review of water treatment plant settling pond plans and specifications.

GUIDELINE

Background

1. Permit Required

- A. A NPDES permit is required for all water treatment plants which have an average annual daily production of more than 100,000 gallons of potable water.
- B. A NPDES permit is required for water treatment plants which have an average annual daily production under 100,000 gallons of potable water only if the operation has a discharge which causes a violation of water quality standards.
- C. A NPDES permit is not required for any water treatment plant which operates for less than two months of the year unless the operation has a discharge which causes a violation of water quality standards.

2. Effluent Limitations and Monitoring Requirements

A. Effluent Limitations

<u>Parameter</u>	<u>Limitation</u>
Flow	(to be inserted) - monthly average
Settleable Solids	0.1 ml/l - maximum
pH	within the range 6.0-9.0

B. Monitoring Requirements

<u>Parameter</u>	<u>Sampling Frequency</u>	<u>Sample Type</u>
Flow	weekly	daily total
Settleable Solids	weekly	composite*
pH	weekly	grab

*Composite sample shall consist of four grab samples equally spaced over the backwash cycle.

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Design Considerations for Settling Ponds

1. General

Minimum Number of Cells:	2
Minimum Volume (each):	Adequate to provide 1.5 hours of theoretical detention time at maximum backwash rate + storage space for solids accumulation.
Length/Width Ratio:	2:1 minimum 3:1 desirable
Maximum Desirable Solids Depth (to facilitate drying & cleaning):	2 feet
Approximate Solids Content of Sludge Prior to Dewatering of Ponds:	8 to 10% solids (alum sludge)

2. Desirable Design Features

Inlet distribution manifold for flow distribution (readily removable to facilitate pond cleaning).

Outlet collection manifold or timber baffles for flow distribution (readily removable to facilitate pond cleaning).

Outlet structure with facilities to allow decanting of water from the pond surface to any probable solids interface level.

Emergency overflow.

Adequate security fencing.

Adequate graveled access roads for equipment to remove solids from ponds.

If solids removal is to be performed by equipment entering the ponds, provide access ramps and base material on pond bottom to allow equipment to operate.

3. Other

Consider installing a sand bottom and underdrain system where climatic or ground water conditions necessitate this expense.

Consideration may also be given to providing for recycle of pond effluent back to the treatment plant. If pond effluent is to be recycled, the ponds must act as surge basins. In most cases, ponds designed under the above criteria will have ample volume when operated as surge basins, but careful consideration must be given to the outlet facilities to allow operation at variable levels and rates.

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4. Alternative Methods

- A. Mechanical treatment processes or settling ponds which vary from the guidelines presented in 3 will be acceptable provided adequate engineering data are furnished which demonstrate the proposed treatment process will satisfy the effluent limitations stated in 2.
- B. All variations of the settling pond alternative should provide a minimum detention time for sedimentation of 1.5 hours based on the maximum backwash rate.
- C. Discharge to a sanitary sewer system is a viable alternative where the chemical additives are alum and/or polyelectrolytes. Other chemical additives would have to be evaluated on a case-by-case basis.

Approved by: _____

David W. Reedy

Date: _____

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